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AUTHOR Fraser, Barry J.
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ABSTRACT

How feedback information based upon student perceptions might be employed as a basis for reflection upon, discussion of, and systematic attempts to improve classroom environments is described. The basic logic underlying the proposed approach involves: (1) using assessments of student perceptions of both their actual and preferred environment to identify discrepancies between actual classroom environment and that preferred by students' and (2) implementing strategies aimed at aligning the actual classroom environment more closely with that preferred by students. An important feature of the paper is that it provides a concrete illustration of the proposed methods by describing a recent small-scale study in which information about student perceptions was used successfully in guiding improvement in a particular classroom. Findings showed that appreciable changes in environment were perceived for only those dimensions on which improvement had been attempted by the teacher. (Author/GK)

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# PROMISING DIRECTIONS IN CURRICULUM KNOWLEDGE: AN ENVIRONMENTAL PERSPECTIVE

BARRY J. FRASER

Macquarie University, Sydney, Australia

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During the 1970s, considerable international interest in the conceptualization, assessment, and investigation of students' perceptions of psychosocial aspects of their classroom learning environments has established classroom environment as a thriving field of research (see overviews of Fraser, 1980a, 1981a; Fraser and Walberg, 1981; Moos, 1979; Walberg, 1979). Although the Learning Environment Inventory (Anderson and Walberg, 1974) and the Classroom Environment Scale (Trickett and Moos, 1973) are the instruments used most widely in prior research, the Individualized Classroom Environment Questionnaire (Rentoul and Fraser, 1979) has been employed in some recent studies to measure dimensions especially salient in open or individualized classrooms. Nevertheless, despite this escalated interest in classroom environment research, surprisingly little attention has been given to exploring how educators might apply ideas from the field of classroom environment in facilitating practical improvements in classrooms.

The purpose of this paper is to describe how feedback information based upon student perceptions might be employed as a basis for reflection upon, discussion of, and systematic attempts to improve classroom environments. The basic logic underlying the proposed approach involves, first, using assessments of student perceptions of both their actual and preferred environment to identify discrepancies between the actual classroom environment and that preferred by students and, second, implementing strategies aimed at aligning the actual classroom environment more closely with that preferred by students (Fraser, 1981b). This strategy can be justified partly in terms of some recent person-environment fit research which suggests that students achieve better in classrooms in which there is a higher congruence between actual and preferred environment (Fraser and Rentoul, 1980; Fraser, 1981c). Furthermore, an important feature of the present paper is that it provides a concrete illustration of the proposed method by describing a recent small-scale study in which information about student perceptions was used successfully in guiding improvements in a particular classroom.

## Related Literature

Although very little literature deals directly with the use of student environment perceptions in facilitating change in classroom environments, there exists some interesting literature which is related indirectly to this task. For example, British curriculum workers such as Lawrence Stenhouse (1975) and John Elliott (1976-77) have advocated that teachers should adopt an exploratory, self-reflective, self-monitoring stance on their own teaching. In particular, these workers recommend a mode of action research in which teachers deliberately and systematically reflect upon, discuss, and question their own classroom practice as a basis for improving their teaching. Also the American curriculum theorist, Joseph Schwab, advocates that the curriculum

field should rely less on theory and more on practical methods and principles applicable in concrete situations, and emphasizes the need to incorporate the learning milieu (or environment) as one of the "commonplaces" that should be taken into account in deliberations about classroom practice (Schwab, 1973; Schubert, 1980).

The literature describing classroom interaction analysis, microteaching, and teacher self-evaluation also provides valuable sources of ideas about the use of feedback to teachers as a means of promoting improved classroom practice. Classroom interaction analysis (Dunkin and Biddle, 1974; Peterson and Walberg, 1979) involves the coding of classroom communication (usually verbal) according to category schemes, and has been used extensively and successfully in preservice and inservice education as a way of making teachers aware of and subsequently improving their own teaching. Used for this purpose, interaction analysis has provided teachers with a method of obtaining specific feedback on their classroom practice and a firm basis for reflection, discussion, and improvement related to their teaching. Microteaching usually involves the recording on videotape of a teacher's presentation of a teaching episode to a small group of students, followed by feedback involving the teacher, supervisors, and peers (Brown, 1975; Olivero, 1970). Recently, several writers have advocated that teachers should play a more prominent role in curriculum evaluation and in the self-evaluation of their own work (Bodine, 1973; Davis, 1980; Harlen, 1978). When using self-evaluation procedures, teachers employ various feedback techniques (e.g., use of rating forms, observation by colleagues) to identify areas in which teachers' classroom behaviors differ from what they consider ideal.

Although no prior study has used environment perceptions in attempting to improve school classroom environments specifically, analogous and valuable work has been attempted in other settings. For example, profiles of milieu inhabitants' perceptions have been employed successfully in facilitating changes in psychiatric hospital wards (Pierce, Trickett and Moos, 1972; Verinis and Flaherty, 1978), a college classroom (DeYoung, 1977), an adolescent residential care centre (Moos and Otto, 1972), an alcoholism treatment program (Bliss, Moos and Bromet, 1976), and a staff work milieu (Schroeder, 1979). Moreover, most of these studies have involved fundamental procedures which are potentially applicable to classroom settings. Basically the procedures involve, first, assessing individuals' perceptions of their actual and preferred environment, second, examining profiles of actual and preferred scores in order to identify actual-preferred discrepancies, third, concrete planning of specific methods by which the actual environment might be changed in order to align it more closely with the preferred environment, and, finally, a reassessment of perceived environment in order to determine the extent to which attempts at environmental improvement were successful.

Individualized Classroom Environment Questionnaire

The classroom environment instrument employed in the present attempt to facilitate environmental improvement was the Individualized Classroom Environment Questionnaire (ICEQ). This instrument differs from others in that it assesses dimensions (namely, Personalization, Participation, Independence, Investigation, and Differentiation) which differentiate individualized and conventional classrooms. Another feature which distinguishes the ICEQ from most other classroom environment instruments is that it has distinct forms which permit measurement of student perceptions of actual classroom environment and student perceptions of preferred classroom environment. The preferred form is concerned with goals and value orientations and measures perceptions of the classroom environment ideally liked or preferred. Furthermore, having separate actual and preferred forms enables the ICEQ to be used to identify changes needed to align the actual classroom environment with the preferred environment as perceived by students.

The initial development of the ICEQ (see Rentoul and Fraser, 1979) was guided by two main criteria. First, dimensions chosen characterized the classroom learning environment described in the literature of individualized education, including open and inquiry-based classrooms (e.g., Rathbone, 1971; Weisgerber, 1971; Walberg and Thomas, 1972). Second, dimensions chosen and individual questionnaire items were considered salient and suitable by a group of educational researchers, practising teachers, and secondary school students. Important steps in developing the ICEQ involved modifying an original pool of items after receiving reactions solicited from educational researchers, practising teachers, and junior high school students, and further refining the scales to form a final version by application of item analysis techniques to data collected from several different samples of teachers and students.

The final version of the ICEQ contains 50 items, with each of the five dimensions being assessed by 10 items. Item wording is identical in all four forms of the ICEQ, but a different set of instructions is used for each form. Each item is scored on a five-point scale with responses of Almost Never, Seldom, Sometimes, Often, and Very Often. The scoring direction is reversed for approximately half of the items. Table 1 further clarifies the nature of the ICEQ by providing a scale description and sample item for each scale.

The actual and preferred forms of the ICEQ have been administered to a sample of 150 junior high school classes in 67 different schools in Australia. A total of 1,849 students replied to the actual form, while 1,858 students responded to the preferred form. Data from these samples have been analyzed to provide information about various statistical characteristics relevant to the validity of ICEQ scales. In particular, estimates of scale internal consistency were calculated using Cronbach's alpha coefficient.

TABLE 1

DESCRIPTIVE INFORMATION FOR EACH SCALE OF ICEQ AND INTERNAL CONSISTENCY (ALPHA RELIABILITY) OF STUDENT ACTUAL AND STUDENT PREFERRED FORMS OF EACH SCALE FOR TWO UNITS OF ANALYSIS

| Scale Name | Description of Scale | Sample Item | Unit of Analysis | Alpha Reliability | |
|---|---|---|---|---|---|
| | | | | Actual | Preferred |
| Personalization | Emphasis on opportunities for individual students to interact with the teacher and on concern for the personal welfare and social growth of the individual | The teacher considers students' feelings. (+) | Indiv.<br>Class | 0.79<br>0.90 | 0.74<br>0.86 |
| Participation | Extent to which students are encouraged to participate rather than be passive listeners | The teacher lectures without students asking or answering questions. (-) | Indiv.<br>Class | 0.70<br>0.80 | 0.67<br>0.75 |
| Independence | Extent to which students are allowed to make decisions and have control over their own learning and behavior | Students choose their partners for group work. (+) | Indiv.<br>Class | 0.68<br>0.78 | 0.70<br>0.79 |
| Investigation | Emphasis on the skills and processes of inquiry and their use in problem-solving and investigation | Students find out the answers to questions and problems from the teacher rather than from investigations. (-) | Indiv.<br>Class | 0.71<br>0.77 | 0.75<br>0.83 |
| Differentiation | Emphasis on the selective treatment of students on the basis of ability, learning style, interests, and rate of working. | Different students use different books, equipment, and materials. (+) | Indiv.<br>Class | 0.76<br>0.91 | 0.75<br>0.92 |

Items designated (+) are scored 1, 2, 3, 4, 5, respectively, for the responses Almost Never, Seldom, Sometimes, Often, Very Often. Items designated (-) are scored in the reverse manner.

Sample size 1,849 students in 150 classes for the Student Actual form and 1,858 students in 150 classes for the Student Preferred form.

Because both the individual student and the class mean have been used commonly in past classroom environment research, indices of the internal consistency for both individual students and class means were generated. These class estimates were made simply by using the variance of class item means in conjunction with the conventional alpha formula. The values of the alpha coefficient shown in Table 1 suggest that each ICEQ scale has acceptable internal consistency for use in its actual and preferred forms and with either the individual student or the class mean as the unit of analysis. Also data reported elsewhere attest to each ICEQ scale's discriminant validity, test-retest reliability, and ability to differentiate between the perceptions of students in different classrooms (Fraser, 1981c).

Recently completed studies have used various forms of the ICEQ as a source of dependent or independent variables, and have yielded promising results supporting the ICEQ's predictive and criterion validity. Three separate studies of the predictive validity of the actual form (Fraser, 1981c, d; Rentoul and Fraser, 1980) have shown that student perceptions accounted for a significant increment in the variance in several attitudinal (but not cognitive) outcomes beyond that attributable to corresponding beginning-of-year attitudes. The criterion validity of the ICEQ was supported by studies showing that scores on several scales of the actual form were significantly higher in classrooms using individualized curriculum materials than in classrooms following conventional materials (Fraser, 1980b). Another study has revealed some fascinating differences between students and their teachers in their perceptions of actual and preferred classroom environment (Fraser, 1981e).

## Attempting to Improve Classroom Environment

The proposed approach to environmental change can be portrayed best by considering a specific attempt at improving classroom environment which was carried out during 1980. This involved a teacher from a private secondary school in a suburb of Sydney in employing actual and preferred forms of the ICEQ in a systematic attempt to improve the environment of one of his classes. This class consisted of 31 seventh grade boys of mixed ability who were studying English, mathematics, and history with this teacher. The procedure followed incorporated the following five fundamental steps:

1. Assessment The teacher administered the ICEQ to all students in the class. The actual form was answered first, while the preferred form was administered in the same time slot one week later.

2. Feedback The teacher was provided with feedback information derived from student responses to the ICEQ. Student data were analyzed by computer by university staff, and presented to the teacher in the form of profiles representing the class means of students' actual and preferred environment scores (see Figure 1). During a visit to the school, university staff explained the interpretation of results to the teacher who found the profiles a particularly useful and easily comprehensible way of summarizing the data.

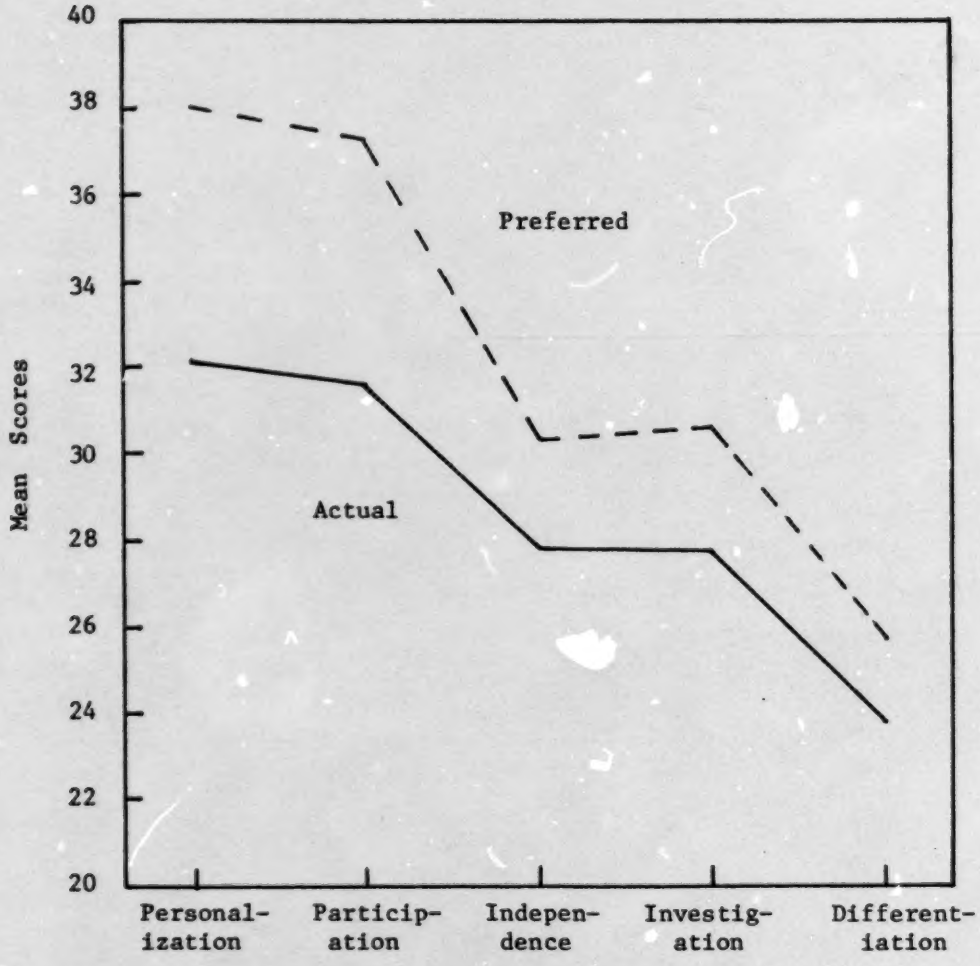


FIGURE 1

PRETEST PROFILES OF MEAN ACTUAL AND PREFERRED SCORES

In particular, the profiles permitted ready identification of changes in classroom environment needed in order to reduce discrepancies between the nature of the actual environment and the preferred environment as currently perceived by students.

3. Reflection and discussion The teacher engaged in private reflection and informal discussion with university staff about the profiles. This further clarified the interpretation and implications of the profiles and provided the basis for a decision about whether an attempt would be made to change the environment in terms of some of the ICEQ's dimensions. The main criteria used for selection of a dimension for inclusion in an attempt to change classroom environment were, first, that there should exist a sizable actual-preferred discrepancy on that variable and, second, that the teacher should feel concerned about this discrepancy and want to make an effort to reduce it. Also it was considered impractical for the teacher to attempt simultaneously to change more than two or three different environment variables. These considerations led the teacher to decide to introduce an intervention aimed at increasing the levels of Personalization and Participation in his class.

4. Intervention The teacher introduced an intervention of approximately one month's duration in an attempt to increase classroom Personalization and Participation. This intervention consisted of a variety of strategies, some of which originated during a number of meetings between the teacher and university personnel, and others of which were suggested by examining ideas contained in individual ICEQ items. Strategies implemented to enhance classroom Personalization involved the teacher in moving around the class more to mix with students, asking students about their welfare, praising and encouraging students, chatting with and being warm toward students, and avoiding snappiness. This required some restructuring of lessons so that the teacher had more time for moving around the class. Strategies used by the teacher in attempting to increase Participation were reducing teacher talk, providing more time for students to ask and answer questions, and organizing more group work. In brief, the overall rationale for these strategies was to place greater emphasis on the human element in teaching.

5. Reassessment The Student Actual form of the ICEQ was administered at the end of the month of intervention to see whether students were perceiving their classroom environment differently from before. Again data were analyzed by computer and fed back to the teacher. This was accompanied by lengthy discussion about the meaningfulness of results and about the potential applicability of the procedures followed for use by other teachers.

The main practical problems experienced during the project were the length of time needed for students to complete the questionnaires, and the time delays involved between questionnaire administration and the feedback of information from computer analyses to the teacher. Because of these problems, a new, shorter 25-item version of the ICEQ has been developed to permit a more rapid assessment of actual and preferred environment. Although the reliability of the short form is somewhat lower than that of the long form, reliability is still more than adequate for the present purpose of generating class mean profiles. Another major merit of the new short form is that it is suitable for rapid hand scoring; consequently, delays between questionnaire administration and feedback of results can be reduced markedly.

## Results

The results of the study are summarized graphically in Figure 2. Figure 2 compares profiles of student actual-prepared discrepancy scores obtained before and after the intervention. These discrepancy scores were obtained simply by subtracting the class mean score for students' perceptions of actual environment from the mean score for preferred environment on each of the ICEQ's five scales. The unbroken line in Figure 2 is the pretest discrepancy profile which corresponds to the separate pretest actual and preferred profiles in Figure 1. The distances between points on the discrepancy profiles and the horizontal line in Figure 2 represent the necessary increase in each area needed for the class to become as students would prefer it.

Figure 2 clearly illustrates that, during the time of the intervention, an appreciable reduction in actual-preferred discrepancy occurred for the dimensions of Personalization and Participation, but that a negligible change occurred for the Independence, Investigation, and Differentiation scales. These findings are especially noteworthy because the two dimensions on which the appreciable changes were recorded were those, and only those, on which the teacher had attempted to promote change.

To further illustrate these findings, a *t* test for dependent samples for the significance of pretest-posttest changes in discrepancy scores was conducted for each scale. (Since only a single assessment of preferred environment was made, these *t* tests for pretest-posttest changes in discrepancy scores are equivalent to *t* tests for pretest-posttest changes in actual scores.) It was found that, during the intervention, large and statistically significant reductions occurred in actual-preferred discrepancy on the Personalization and Participation scales, but that negligible changes occurred on the other three ICEQ scales.

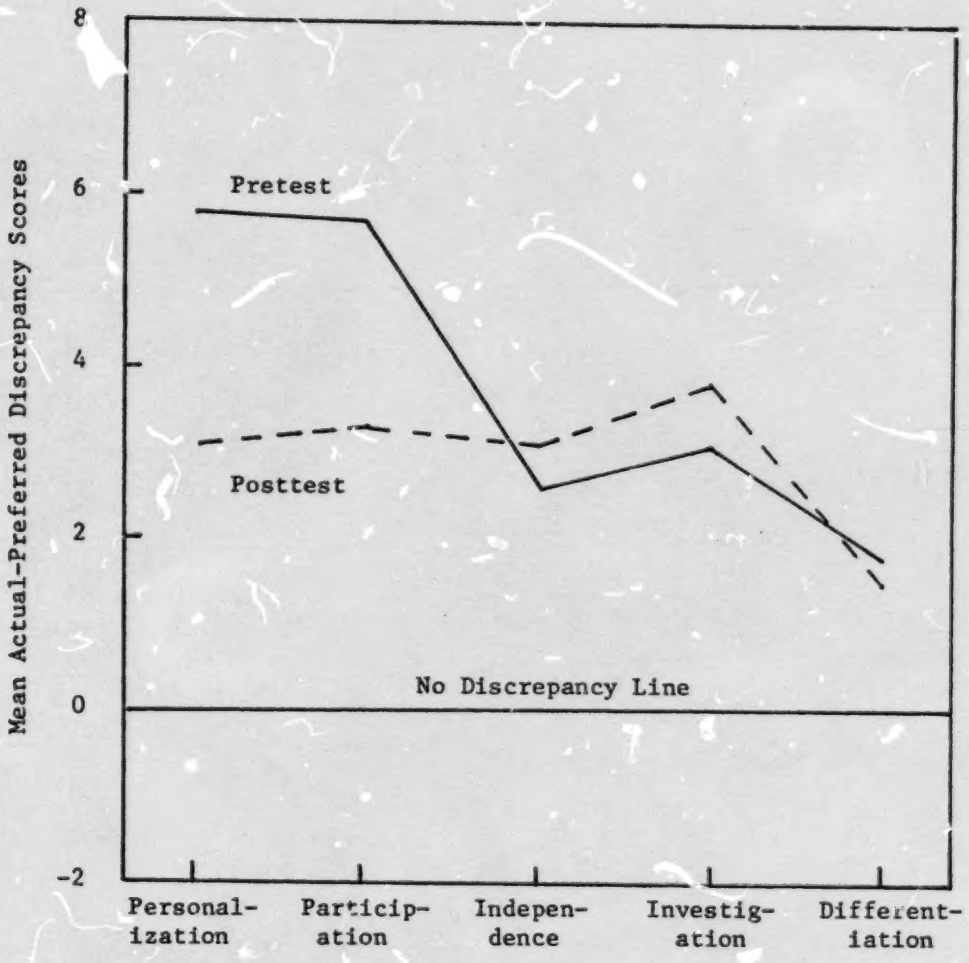


FIGURE 2

PRETEST AND POSTTEST PROFILES OF MEAN ACTUAL-PREFERRED

DISCREPANCY SCORES

Generally the teacher found that information obtained from administration of the ICEQ was meaningful and that it was possible to identify phenomena in the class which were contributing to the profiles. In particular, the changes in environment picked up through use of the questionnaires accorded with the teacher's intuitive expectations based on student comments and classroom events. These observations are important because they suggest that, in this instance, the ICEQ was able to provide the teacher with feedback information about his class which appeared plausible, which made him aware of specific problem areas, and which suggested starting points for implementing improvements.

## Conclusion

This paper describes a method of facilitating improvements in classroom environment based on information about student perceptions of their actual and preferred environment, and illustrates this approach by reporting a recent small scale-study. The promising findings from the study were that appreciable changes in environment were perceived for those dimensions, and only those dimensions, on which improvement had been attempted by the teacher. Although the tentativeness of findings must be acknowledged, the present work suggests the potential usefulness of employing classroom environment instruments to provide teachers with meaningful information about problem areas and a tangible basis to guide improvements in these areas. It is hoped that the approaches and instruments described here will stimulate interest among other educators in the worthwhile enterprise of facilitating improvement in classroom environments.

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